

### **AMENDMENT TO THE SPECIFICATION**

Please amend the paragraph beginning on page 5, line 1 as follows:

Herein, it is effective that the step (b) is a step of verifying that the predetermined amount of the sample solution is held in the sample cell based on the fact that an absolute value of an amount of change in the output signal [[per hour]] over time is maintained at the first predetermined value or less for the first predetermined duration or longer.

Please amend the paragraph beginning on page 5, line 7 as follows:

Further, it is effective that the step (b) is a step of detecting an inflow of the sample solution into the sample cell based on the fact that the absolute value has become the second predetermined value or greater, followed by verifying that the predetermined amount of the sample solution is held in the sample cell based on the fact that the absolute value of an amount of change in the output signal [[per hour]] over time is maintained at the first predetermined value or less for the first predetermined duration or longer, after detecting the inflow.

Please amend the paragraph beginning on page 7, line 4 as follows:

This method for controlling a measurement system is a method for controlling a measurement system used for a measurement of an optical characteristic in an optimum condition for the measurement. It is effective that the method further comprises a step of verifying that the sample solution has become stable based on the fact that the absolute value of the amount of change in the output signal [[per hour]] over time is maintained at the fifth predetermined value or less for the second predetermined duration or longer, after the step (b) and before the step (c).

Please amend the paragraph beginning on page 17, line 6 as follows:

Namely, the most remarkable feature of the present invention lies in verifying that the sample solution is inflowing into the sample cell, that a predetermined amount of the sample solution is held in the sample cell, and that a bubble or the like in the sample solution held in the sample cell has disappeared so that the sample solution has become stable, by measuring the output signal S and an absolute value  $|dS(t)/dt|$  of an amount of change in the output signal S [[per hour]] over time "t" in the method for verifying an amount of a sample solution comprising the steps of: (a) detecting at least one selected from the group consisting of a transmitted light component, a scattered light component and a reflected light component of a light by a photosensor while irradiating a sample solution, which is being injected into a sample cell, with the light and (b) verifying that a predetermined amount of the sample solution is held in the sample cell based on a change in an output signal from the photosensor.

Please amend the paragraph beginning on page 17, line 23 as follows:

[0058] Herein, the absolute value  $|dS(t)/dt|$  of the amount of change in the output signal S [[per hour]] over time t can be expressed as the gradient of the tangent in the graph shown in FIG. 2. Accordingly, in the present invention, the method for verifying that a predetermined amount of a sample solution is held in the sample cell based on a change in the output signal from the photosensor, for example, on the basis of the test result shown in FIG. 2, can be exemplified by the following combinations, although it is not limited thereto.

Please amend the paragraph beginning on page 21, line 23 and ending on page 22, line 5 as follows:

While sending this open signal, the computer 9 was set to be on standby for verifying the amount of the sample solution when an absolute value of an amount of change in an output signal S from a photosensor 8 [[per hour]] over time  $dS(t)/dt$  had become the second predetermined value or greater. For example, it was set to be on standby for verifying the amount of the sample solution when the absolute value of the amount of change in the output signal S [[per hour]] over time  $dS(t)/dt$  had become 0.1 V/sec or greater in FIG. 2.

Please amend the paragraph beginning on page 22, line 6 as follows:

In the state of being on standby for verifying the amount of the sample solution and sending the open signal, it was verified that a predetermined amount of the sample solution was held based on the fact that the absolute value of the amount of change in the output signal S from the photosensor 8 [[per hour]] over time  $dS(t)/dt$  was maintained at the first predetermined value or less for the first predetermined duration or longer. For example, it was verified that the predetermined amount of the sample solution was held when  $dS(t)/dt$  was maintained at 0.01 V/sec or less for 0.5 second or longer, and a close signal was sent to the electromagnetic valve 4. By such controlling, d became 10.5 mm or greater, and therefore, 5.25 ml or more of the sample solution was held in the sample cell 1.

Please amend the paragraph beginning on page 23, line 3 as follows:

According to this example, not only the amount of change in the output signal S from the photosensor 8 [[per hour]] over time  $dS(t)/dt$ , but also the duration in which this amount of change was maintained was verified, which provided an effect of preventing the following

erroneous operation.

Please amend the paragraph beginning on page 23, line 20 as follows:

In contrast, in the present invention, not only the absolute value of the amount of change in the output signal S [[per hour]] over time  $dS(t)/dt$ , but also the duration in which this amount of change was maintained was verified, and therefore, an erroneous operation due to such a plurality of points of inflection could be prevented.

Please amend the paragraph beginning on page 23, line 26 and ending on page 24, line 9 as follows:

As described above, the amount of the sample solution could be verified precisely when the sample solution was supplied into the sample cell, by setting the apparatus to be on standby for verifying the amount of the sample solution when the amount of change in the output signal [[per hour]] over time  $dS(t)/dt$  had become the second predetermined value or greater, and verifying that the predetermined amount of the sample solution was held when  $dS(t)/dt$  was maintained at the first predetermined value or less for the first predetermined duration or longer.

Please amend the paragraph beginning on page 26, line 6 as follows:

First, while 5 ml or more of a sample solution was being injected in the funnel 3 for trapping the sample solution, the computer 9 sent an open signal to the electromagnetic valve 4, thereby starting the dropping of the sample solution trapped in the funnel 3 into the sample cell 1 at 0.5 ml/sec. While sending this open signal, the computer 9 was set to be on standby for verifying an amount of a sample solution based on the fact that an absolute value of an amount of change in the output signal S from the photosensor 8 [[per hour]] over time  $dS(t)/dt$  had become

the second predetermined value or greater. For example, it was set to be on standby for verifying the amount of the sample solution when the absolute value of the amount of change in the output signal S [[per hour]] over time  $dS(t)/dt$  had become 0.1 V/sec or greater in FIG. 2.

Please amend the paragraph beginning on page 26, line 20 and ending on page 27, line 9 as follows:

In the state of being on standby for verifying the amount of the sample solution and sending the open signal, it was verified that a predetermined amount of the sample solution was held when the absolute value of the amount of change in the output signal S from the photosensor 8 [[per hour]] over time  $dS(t)/dt$  had become the first predetermined value or less and the magnitude of the output signal S from the photosensor 8 had become the third predetermined value or greater. For example, it was determined and verified that the predetermined amount of the sample solution was held when the absolute value of the amount of change [[per hour]] over time  $dS(t)/dt$  had become 0.01 V/sec or less and the magnitude of the output signal S had become 0.8 V or greater, and then a close signal was sent to the electromagnetic valve 4. By such controlling, d became 10 mm or greater, and therefore, 5 ml or more of the sample solution was held in the sample cell 1.

Please amend the paragraph beginning on page 27, line 10 as follows:

According to this example, the amount of the sample solution was verified based on not only the absolute value of the amount of change in the output signal S from the photosensor 8 [[per hour]] over time  $dS(t)/dt$ , but also the fact that the magnitude of the output signal S had become a predetermined value or greater, so that the following erroneous operation that might occur in Example 1 of the present invention could be prevented.

Please amend the paragraph beginning on page 27, line 18 and ending on page 28, line 2 as follows:

For example, when a bubble adhered to the optical window of the sample cell to be present in the optical path of the substantially parallel light 7 during the supply of the sample solution into the sample cell, the substantially parallel light 7 was scattered and reflected by the bubble, and therefore could not reach the photosensor 8. In this case, the absolute value of the amount of change in the output signal S from the photosensor 8 [[per hour]] over time might also become 0.01 V/sec or less, resulting in an erroneous operation of mistakenly verifying that the predetermined amount of the sample solution was held.

Please amend the paragraph beginning on page 28, line 3 as follows:

Such an erroneous operation due to a bubble, however, could be prevented by considering the magnitude of the output signal S as a factor in the verification, in addition to the absolute value of the amount of change in the output signal S [[per hour]] over time. Moreover, when the parameter was set as in this example, it was not necessary to verify that the absolute value of the amount of change  $dS(t)/dt$  was maintained at the second predetermined value or less for the first predetermined duration or longer, as opposed to the case where it was set as in Example 1. Thus, it became possible to shorten the time required for verifying the amount of the sample solution by the first predetermined duration, improving the efficiency of the measurement.

Please amend the paragraph beginning on page 29, line 24 and ending on page 30, line 11 as follows:

In the state of being on standby for verifying the amount of the sample solution and sending the open signal, it was verified that a predetermined amount of the sample solution was held based on the fact that the absolute value of the amount of change in the output signal S from the photosensor 8 [[per hour]] over time  $dS(t)/dt$  was maintained at the first predetermined value or less for a predetermined duration or longer. For example, it was verified that the predetermined amount of the sample solution was held when  $dS(t)/dt$  was maintained at 0.01 V/sec or less for 0.5 second or longer, and then a close signal was sent to the electromagnetic valve 4. By such controlling, d became 10.5 mm or greater, and therefore, 5.25 ml or more of the sample solution was held in the sample cell 1.

Please amend the paragraph beginning on page 30, line 12 as follows:

Next, from this state, it was verified that the amount of change in the output signal S [[per hour]] over time  $dS(t)/dt$  was maintained at the fifth predetermined value or less for the second predetermined duration or longer for starting the measurement of an optical characteristic of the sample solution. For example, the point of time, at which  $dS(t)/dt$  was maintained at 0.003 (V/sec) or less for 0.5 second or longer, was verified. In FIGS. 2 and 3,  $dS(t)/dt$  had become 0.003 (V/sec) or less when 11.1 seconds had elapsed since the start of the dropping of the sample solution, and therefore, the point of time, at which 11.6 seconds had elapsed since the start of the dropping, was verified.

Please amend the paragraph beginning on page 31, line 9 as follows:

According to this example, the amount of change in the output signal S from the photosensor 8 [[per hour]] over time  $dS(t)/dt$  and the duration in which this amount of change was maintained were verified after verifying that the predetermined amount of the sample solution was held in the sample cell 1, and therefore, the reliability of the measurement of an optical characteristic could be enhanced because of the following reason.

Please amend the paragraph beginning on page 32, line 17 as follows:

In contrast, in the present invention, not only the absolute value of the amount of change in the output signal S [[per hour]] over time  $dS(t)/dt$ , but also the duration in which this amount of change was maintained was verified, and therefore, an erroneous operation due to such a plurality of points of inflection could be prevented.

Please amend the paragraph beginning on page 46, line 26 and ending on page 47, line 14 as follows:

First, while 5 ml or more of a sample solution was being injected in the funnel 3 for trapping the sample solution, the computer 9 sent an open signal to the electromagnetic valve 4, thereby starting the dropping of the sample solution trapped in the funnel 3 into the sample cell 19 at 0.5 ml/sec. While sending this open signal, the computer 9 was set to be on standby for verifying an amount of a sample solution based on the fact that an absolute value of an amount of change in an output signal S from the photosensor 24 [[per hour]] over time  $dS(t)/dt$  had become the second predetermined value or greater. For example, the computer 9 was set to be on standby for verifying the amount of the sample solution based on the fact that the absolute value of an amount of change in the output signal S [[per hour]] over time  $dS(t)/dt$  had become 0.1 V/sec or

greater in FIG. 9.

Please amend the paragraph beginning on page 47, line 15 and ending on page 48, line 2 as follows:

In the state of being on standby for verifying the amount of the sample solution and sending the open signal, it was verified that a predetermined amount of the sample solution was held based on the fact that the absolute value of the amount of change in the output signal S from the photosensor 24 [[per hour]] over time  $dS(t)/dt$  was maintained at the first predetermined value or less for the first predetermined duration or longer. For example, it was verified that the predetermined amount of the sample solution was held when  $dS(t)/dt$  was maintained at 0.01 V/sec or less for 0.5 second or longer, and then a close signal was sent to the electromagnetic valve 4. By such controlling, d became 10.5 mm or greater, and therefore, 5.25 ml or more of the sample solution was held in the sample cell 19.

Please amend the paragraph beginning on page 49, line 18 as follows:

According to this example, not only the amount of change in the output signal S from the photosensor 24 [[per hour]] over time  $dS(t)/dt$ , but also the duration in which this amount of change was maintained was verified, and therefore, the following erroneous operation could be prevented.

Please amend the paragraph beginning on page 49, line 23 and ending on page 50, line 9 as follows:

At a point of inflection, at which the output signal S from the photosensor 28 that had been decreasing turned to increase (or that had been increasing turned to decrease),  $dS(t)/dt$

reversed in sign of plus and minus. Therefore, at this point of inflection, which generated instantaneously,  $dS(t)/dt$  became zero. Thus, when it was verified only that an absolute value of  $dS(t)/dt$  had become the first predetermined value or less, an erroneous operation occurred. However, by verifying not only the absolute value of the amount of change in the output signal S [[per hour]] over time  $dS(t)/dt$ , but also the duration in which this amount of change was maintained, an erroneous operation due to such a plurality of points of inflection could be prevented.

Please amend the paragraph beginning on page 50, line 10 as follows:

As described above, the amount of the sample solution could be verified when the sample solution was supplied into the sample cell, by setting the apparatus to be on standby for verifying the amount of the sample solution based on the fact that an amount of change in the output signal S [[per hour]] over time  $dS(t)/dt$  had become the second predetermined value or greater, and verifying that a predetermined amount of the sample solution was held when  $dS(t)/dt$  was maintained at the first predetermined value or less for the first predetermined duration or longer.

Please amend the paragraph beginning on page 54, line 9 as follows:

In this example, as in Example 6, while the sample solution was being dropped into the sample cell 19, the amount of the sample solution was verified based on the fact that an amount of change in the output signal S from the photosensor 24 [[per hour]] over time  $dS(t)/dt$  had become the second predetermined value or less and that the output signal S from the photosensor 24 had become the fourth predetermined value or less. For example, it was verified that the predetermined amount of the sample solution was held when  $dS(t)/dt$  had become 0.01 V/sec or less and S had become 0.01 V or less, and then a close signal was sent to the electromagnetic

valve 4. By such controlling, d became 10 mm or greater, and therefore, 5 ml or more of the sample solution was held in the sample cell 19.

Please amend the paragraph beginning on page 54, line 22 as follows:

As such, according to this example, the amount of the sample solution was verified based on not only the absolute value of the amount of change in the output signal S from the photosensor 24 [[per hour]] over time, but also the fact that the magnitude of the output signal S had become a predetermined value or less, so that the following erroneous operation that might occur in Example 6 could be prevented.

Please amend the paragraph beginning on page 55, line 3 as follows:

For example, when a bubble adhered to an optical window of the sample cell to be present in the optical path of the substantially parallel light 7 during the supply of the sample solution into the sample cell, the substantially parallel light 7 was scattered and reflected by the bubble, and therefore could not reach the photosensor 24. Even in this case, the absolute value of the amount of change in the output signal S from the photosensor 24 [[per hour]] over time might become 0.01 V/sec or less, resulting in an erroneous operation of mistakenly verifying that the predetermined amount of the sample solution was held. Such an erroneous operation due to a bubble, however, could be prevented by considering the magnitude of the output signal S as a factor in the verification, in addition to the absolute value of the amount of change in the output signal S [[per hour]] over time.

Please amend the paragraph beginning on page 55, line 18 and ending on page 56, line 3 as follows:

Next, from this state, it was verified that the amount of change in the output signal S [[per hour]] over time  $dS(t)/dt$  was maintained at the fifth predetermined value or less for the second predetermined duration or longer for starting the measurement of an optical characteristic of the sample solution. For example, the point of time, at which  $dS(t)/dt$  was maintained at 0.0015 (V/sec) or less for 0.5 second or longer, was verified. In FIGS. 9 and 10,  $dS(t)/dt$  had become 0.0015 (V/sec) or less when 11.1 seconds had elapsed since the start of the dropping of the sample solution, and therefore the point of time, at which 11.6 seconds had elapsed since the start of the dropping, was verified.

Please amend the paragraph beginning on page 56, line 7 as follows:

According to this example, the amount of change in the output signal S from the photosensor 24 [[per hour]] over time  $dS(t)/dt$  and the duration in which this amount of change was maintained were verified after verifying that the predetermined amount of the sample solution was held in the sample cell 19, and therefore, the reliability of the measurement of an optical characteristic could be enhanced because of the following reason.

Please amend the paragraph beginning on page 56, line 15 and ending on page 57, line 2 as follows:

Even after the inflow of sample solution into the sample cell 19 was suspended, a bubble or the like generated during the inflow might be present in the optical path of the substantially parallel light 7, thereby causing a fluctuation in the output signal S from the photosensor 24. This fluctuation deteriorated the reliability of the optical characteristic measurement. Therefore, the

measurement was started after a bubble disappeared from the optical path, for example, by surfacing, and the fluctuation in the output signal had subsided. In other words, the measurement was started after the amount of change [[per hour]] over time  $dS(t)/dt$  was maintained at the fifth predetermined value or less for the second predetermined duration or longer. Consequently, the reliability of the measurement could be ensured.

Please amend the paragraph beginning on page 57, line 19 as follows:

When calculating the amount of change in the output signal S from the photosensor 24 [[per hour]] over time  $dS(t)/dt$  in real time, it was necessary to either configure a differentiation circuit in an analog fashion or to perform a digital calculation. The differentiation time constant of the circuit in the former case, and the sampling interval in the latter case must be sufficiently less than the first predetermined duration or the second predetermined duration, or otherwise, the response speed would decrease to prolong the time required for verification after the predetermined amount of the sample solution was held. As a result, the time required for the entire measuring process was prolonged, resulting in reduced efficiency of the measurement. In each of Examples of the present invention, there was described the case where the differentiation time constant or the sampling interval was sufficiently less than the first predetermined duration and the second predetermined duration.